

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, or claims in the application.

**Listing of Claims:**

1. (Currently Amended): A method for labeling nucleic acids, the method comprising:
  - a) contacting nucleic acid molecules with hydrogen peroxide and ~~a redox active coordination complex~~ phenanthroline-Cu(II) for a time and at concentrations sufficient to produce nucleic acid single strand scission and free-aldehyde moieties on either the 5' or 3' end of the molecules at the site of scission;
  - b) reacting the aldehyde moieties with amine to produce a condensation product; and
  - c) labeling the condensation product.
2. (original): The method as recited in claim 1 wherein the step of labeling the condensation product further comprises:
  - a) reducing the condensation product; and
  - b) contacting the reduced condensation product with a chromophore.
3. (Canceled)
4. (original): The method as recited in claim 1 wherein the amine is a primary amine.
5. (original): The method as recited in claim 1 wherein the amine is ethylene diamine or hydrazine or aminated biotin.

6. (original): The method as recited in claim 1 wherein the contacting step occurs in an anaerobic environment.

7. (original): The method as recited in claim 1 wherein the step of labeling the condensation product further comprises reducing the condensation product and cross-linking the reduced condensation product with a label in one reaction step.

8. (Currently Amended): The method as recited in claim 1 wherein the step of contacting the nucleic acid molecules with ~~redox-active coordination complex~~ phenanthroline-Cu(II) includes contacting the nucleic acid with a denaturing agent.

9. (Currently Amended): A method for modifying nucleic acids, the method comprising:

- a) producing free radicals by reacting hydrogen peroxide with phenanthroline-Cu(II)
- a)b) contacting the produced free radicals with the nucleic acids to produce single stranded-scission, ~~free~~ scission-free nucleic acid bases and aldehyde forms of ribose and deoxyribose at either the 5' ends or 3' ends at the site of scission;
- b)c) contacting the aldehyde forms with an amine to produce a condensation product;
- c)d) reducing the condensation product; and
- d)e) labeling the reduced condensation product.

10. (Canceled)

11. (Canceled)

12. (Currently Amended): The method recited in claim 9 wherein steps ~~c-and-d~~ d

and e occur simultaneously.

13. (Currently Amended): The method recited in claim 9 wherein step d e occurs in anaerobic conditions.

14. (original): The method as recited in claim 9 wherein the nucleic acid is double stranded and wherein the step of contacting the free radicals with the nucleic acids is preceded by the addition of a double-strand weakening agent.

15. (original): The method as recited in claim 14 wherein the double-strand weakening agent is a denaturing agent selected from the group consisting of carbonic acid, urea, ethyl carbonate, cyanamide, urethane, and combinations thereof.

16. (original): The method as recited in claim 9 wherein the nucleic acid is modified at temperatures below the boiling point of water.

17. (original): The method as recited in claim 9 wherein the nucleic acid modification occurs at between 0 °C and 95 °C.

18. (original): The method as recited in claim 9 wherein the free radicals are contacted with the nucleic acids in an anaerobic atmosphere.